

CLAIMS

1. A method for increasing the total capacity of a network, the network including a first plurality of communication edges interconnecting a second plurality of communication nodes, the first plurality of communication edges and the second plurality of communication nodes having corresponding first and second pluralities of capacity values respectively, said first and second pluralities of capacity values determining the total capacity of the network, the method comprising:

expanding the capacity value of at least an individual communication edge from among said first plurality of communication edges, the individual edge connecting first and second communication nodes from among said second plurality of communication nodes, without expanding the capacity value of said first communication node.

2. A method according to claim 1 and also comprising:

performing said expanding step until the total capacity of the network reaches a desired level; and

expanding the capacity values of at least one of the second plurality of communication edges such that all of the second plurality of communication edges have the same capacity.

3. A method for expanding the total capacity of a network, the network including a first plurality of communication edges interconnecting a second plurality of communication nodes, the first plurality of communication edges and the second plurality of communication nodes having corresponding first and second pluralities of capacity values respectively, said first and second pluralities of capacity values determining the total capacity of the network, the method comprising:

for each individual node from among the second plurality of communication nodes:

determining the amount of traffic entering the network at the individual node; and

for each edge connected to the individual node, if the capacity of the edge is less than said amount of traffic, expanding the capacity of the edge to said amount of traffic.

4. A method for constructing a network, the method comprising:

installing a first plurality of communication edges interconnecting a second plurality of communication nodes; and

determining first and second pluralities of capacity values for the first plurality of communication edges and the second plurality of communication nodes respectively such that, for at least one individual node, the sum of capacity values of the edges connected to that node exceeds the capacity value of that node.

5. A network comprising:

a first plurality of communication edges having a first plurality of capacity values respectively; and

a second plurality of communication nodes having a second plurality of capacity values respectively,

and wherein said first plurality of communication edges interconnects said second plurality of communication nodes such that, for at least one individual node, the sum of capacity values of the edges connected to that node exceeds the capacity value of that node.

6. A method for allocating traffic to a network, the method comprising:

providing a network including at least one blocking switches;

receiving a traffic requirement; and

allocating traffic to the network such that the traffic requirement is satisfied and such that each of the at least one blocking switches is non-blocking at the service level.

7. A method according to claim 6 wherein said step of allocating traffic comprises:

selecting a candidate route for an individual traffic demand;

if the candidate route includes an occupied segment which include at least one currently inactive link,

searching for a switch which would be blocking at the service level if the inactive link were activated and which has an unused active link which, if activated, would cause the switch not be blocking at the service level if the currently inactive link were activated; and

if the searching step finds such a switch, activating the currently inactive link and inactivating the unused active link.

8. A method according to claim 6 wherein said network comprises an ATM network.

9. A method according to claim 6 wherein said network comprises a TDM network.

10. Apparatus for allocating traffic to a network, the apparatus comprising:

a traffic requirement input device operative to receive a traffic requirement for a network

including at least one blocking switches; and

a traffic allocator operative to allocate traffic to the network such that the traffic requirement is satisfied and such that each of the at least one blocking switches is non-blocking at the service level.

11. A method according to claim 6 wherein said network comprises a circuit switched network.

12. Network expansion apparatus for use in conjunction with a routing system operative to allocate traffic to routes within a communication network including a multiplicity of nodes, each route including at least one link, the apparatus comprising:

a routing system monitor operative to monitor operation of a routing system in order to detect instances of high-level utilization of individual links; and

a link expanding system operative to perform expansions of individual links, if expandable, at which high-level utilization has been detected by the routing system monitor and to provide a corresponding update regarding each link expansion to the routing system.

13. Apparatus for allocating bandwidth within a communication network, the apparatus comprising:

a routing system operative to allocate traffic to routes within the communication network, each route including at least one link;

a local link expander operative to expand at least one link within the communication network in response to high-level utilization of the link by the routing system.